PB-241 626

# IMPLEMENTATION PLAN REVIEW FOR DISTRICT OF COLUMBIA AS REQUIRED BY THE ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT

TRW/Environmental Services

Prepared for:

Environmental Protection Agency

March 1975

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TECHNICAL REPORT DATA
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| 1. REPORT NO. | 2. | 3. PB 241 626 |
|---|---|---|
| EPA-450/3-75-039 | | |

| 4. TITLE AND SUBTITLE | 5. REPORT DATE |
|---|---|
| IMPLEMENTATION PLAN REVIEW FOR DISTRICT OF COLUMBIA AS REQUIRED BY THE ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT | March 1975 |
| | 6. PERFORMING ORGANIZATION CODE |
| 7. AUTHOR(S) | 8. PERFORMING ORGANIZATION REPORT NO. |
| 9. PERFORMING ORGANIZATION NAME AND ADDRESS<br>U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, N.C., Regional Office III, Philadelphia, Pa., and TRW, Inc., Vienna, Virginia | 10. PROGRAM ELEMENT NO. |
| | 11. CONTRACT/GRANT NO.<br>68-02-1385 |
| 12. SPONSORING AGENCY NAME AND ADDRESS<br>U.S. Environmental Protection Agency<br>Office of Air and Waste Management<br>Office of Air Quality Planning and Standards<br>Research Triangle Park, North Carolina 27711 | 13. TYPE OF REPORT AND PERIOD COVERED<br>Final |
| | 14. SPONSORING AGENCY CODE |

15. SUPPLEMENTARY NOTES

16. ABSTRACT

Section IV of the Energy Supply and Environmental Coordination Act of 1974, (ESECA) requires EPA to review each State Implementation Plan (SIP) to determine if revisions can be made to control regulations for stationary fuel combustion sources without interferring with the attainment and maintenance of the national ambient air quality standards. This document, which is also required by Section IV of ESECA, is EPA's report to the State indicating where regulations might be revised.

17. KEY WORDS AND DOCUMENT ANALYSIS

| a. DESCRIPTORS | b. IDENTIFIERS/OPEN ENDED TERMS | c. COSATI Field/Group |
|---|---|---|
| Air pollution<br>State Implementation Plans | | |

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INFORMATION SERVICE
US Department of Commerce
Springfield, VA. 22151

| 18. DISTRIBUTION STATEMENT | 19. SECURITY CLASS *(This Report)* | 21. NO. OF PAGES |
|---|---|---|
| Release unlimited | Unclassified | 32 |
| | 20. SECURITY CLASS *(This page)* | 22. PRICE |
| | Unclassified | $ 3.75 |

EPA Form 2220-1 (9-73)

EPA-450/3-75-039

# IMPLEMENTATION PLAN REVIEW

# FOR

# DISTRICT OF COLUMBIA

# AS REQUIRED BY THE ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT

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March 1975

DISTRICT OF COLUMBIA

ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT
(SECTION IV - IMPLEMENTATION PLAN REVIEW)

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# 1.0 EXECUTIVE SUMMARY

The enclosed report is the U.S. Environmental Protection Agency's (EPA) response to Section IV of the Energy Supply and Environmental Coordination Act of 1974 (ESECA). Section IV required EPA to review each State Implementation Plan (SIP) to determine if revisions can be made to control regulations for stationary fuel combustion sources without interfering with the attainment and maintenance of the National Ambient Air Quality Standards (NAAQS). In addition to requiring that EPA report to the State on whether control regulations might be revised, ESECA provides that EPA must approve or disapprove any revised regulations relating to fuel burning stationary sources within three months after they are submitted to EPA by the States. The States may, as in the Clean Air Act of 1970, initiate State Implementation Plan revisions; ESECA does not, however, require States to change any existing plan.

Congress has intended that this report provide the State with information on excessively restrictive control regulations. The intent of ESECA is that SIP's wherever possible, be revised in the interest of conserving low sulfur fuels or converting sources which burn oil or natural gas to coal. EPA's objective in carrying out the SIP reviews, therefore, has been to try to establish if emissions from combustion sources may be increased. Where an indication can be found that emissions from certain fuel burning sources can be increased and still attain and maintain NAAQS, it may be plausible that fuel resource allocations can be altered for "clean fuel savings" in a manner consistent with both environmental and national energy needs.

In many respects, the ESECA SIP reviews parallel EPA's policy on clean fuels. The Clean Fuels Policy has consisted of reviewing implementation plans with regards to saving low sulfur fuels and, where the primary sulfur dioxide air quality standards were not exceeded, to encourage States to either defer compliance regulations or to revise the $SO_2$ emission regulations. The States have also been asked to discourage large scale shifts from coal to oil where this could be done without jeopardizing the attainment and maintenance of the NAAQS.

To date, EPA's fuels policy has addressed only those States with the largest clean fuels saving potential. Several of these States have or are currently in the process of revising $SO_2$ regulations. These States are generally in the Eastern half of the United States. ESECA, however, extends the analysis of potentially over-restrictive regulations to all 55 States and territories. In addition, the current reviews address the attainment and maintenance of all the National Ambient Air Quality Standards.

There are, in general, four predominant reasons for the existence of overly restrictive emission limitations within the State Implementation Plans. These are (1) the state's prerogative to surpass NAAQS; (2) the use of the example region approach in developing State-wide air quality control strategies; (3) the existence of state air quality standards which are more stringent than NAAQS; and (4) the "hot spots" in only part of an Air Quality Control Region (AQCR) which have been used as the basis for controlling the entire region. Since each of these situations effect many State plans and in some instances conflict with current national energy concerns, a review of the State Implementation Plans is a logical follow-up to EPA's initial appraisal of the SIP's conducted in 1972. At that time SIP's were approved by EPA if they demonstrated the attainment of NAAQS or more stringent state air quality standards. Also, at that time an acceptable method for formulating control strategies was the use of an example region for demonstrating the attainment of the standards.

The example region concept permitted a State to identify the most polluted Air Quality Control Region (AQCR) and adopt control regulations which would be adequate to attain the NAAQS in that region. In using an example region, it was assumed that NAAQS would be attained in the other AQCRs of that State if the control regulations were applied to similar sources. The problem with the use of an example region is that it can result in controls which are more stringent than needed to attain NAAQS, especially in the utilization of clean fuels, for areas of the State where sources would not otherwise contribute to NAAQS violations. For instance, a control strategy based on a particular region or source can result in a regulation requiring 1 percent sulfur oil to be burned state-wide where the use of 3 percent sulfur coal would be adequate to attain NAAQS in some locations.

EPA anticipates that a number of States will use the review findings to assist them in making the decision whether or not to revise portions of their State Implementation Plans. However, it is most important for those States which desire to submit a revised plan to recognize the review's limitations. The findings of this report are by no means conclusive and are neither intended nor adequate to be the sole basis for SIP revisions; they do, however, represent EPA's best judgment and effort in complying with the ESECA requirements. The time and resources which EPA has had to prepare the reports has not permitted the consideration of growth, economics, and control strategy tradeoffs. Also, there has been only limited dispersion modeling data available by which to address individual point source emissions. Where the modeling data for specific sources were found, however, they were used in the analysis.

The data upon which the reports' findings are based are the most currently available to the Federal Government. However, EPA believes that the States possess the best information for developing revised plans. The States have the most up-to-date air quality and emissions data, a better feel for growth, and the fullest understanding for the complex problems facing them in the attainment and maintenance of air quality. Therefore, those States desiring to revise a plan are encouraged to verify and, in many instances, expand the modeling and monitoring data suppororting EPA's findings. In developing a suitable plan, it is suggested that States select control strategies which place emissions for fuel combustion sources into perspective with all sources of emissions such as smelters or other industrial processes. States are encouraged to consider the overall impact which the potential relaxation of overly restrictive emissions regulations for combustion sources might have on their future control programs. This may include air quality maintenance, prevention of significant deterioration, increased TSP, $NO_x$, and HC emissions which occur in fuel switching, and other potential air pollution situations such as sulfates.

Although the enclosed analysis has attempted to address the attainment of all the NAAQS, most of the review has focused on total suspended particulate matter (TSP) and sulfur dioxide ($SO_2$) emissions. This is because stationary fuel combustion sources constitute the greatest source of $SO_2$ emissions and are a major source of TSP emissions.

Part of each State's review was organized to provide an analysis of the $SO_2$ and TSP emission tolerances within each of the various AQCRs. The regional emission tolerance estimate is, in many cases, EPA's only measure of the "over-cleaning" accomplished by a SIP. The tolerance assessments have been combined in Appendix B with other regional air quality "indicators" in an attempt to provide an evaluation of a region's candidacy for changing emission limitation regulations. In conjunction with the regional analysis, a summary of the State's fuel combustion sources (power plants, industrial sources, and area sources) has been carried out in Appendices C, D and E.

The Implementation Plan for the District of Columbia has been reviewed for the most prevalent causes of over-restrictive fuel combustion emission limiting regulations. The major findings of the review are:

FOR BOTH TOTAL SUSPENDED PARTICULATES AND SULFUR DIOXIDE, THERE IS LITTLE INDICATION THAT CURRENT EMISSION REGULATIONS ARE OVER-RESTRICTIVE.

The supportive findings of the SIP review are:

Like many areas of the nation, high levels of total suspended particulates were found in the District of Columbia during 1973. National Ambient Air Quality Standards were exceeded in the District of Columbia and also in the surrounding jurisdictions within the National Capital Interstate Air Quality Control Region.

Sulfur dioxide levels during 1973 exceeded the annual National Ambient Air Quality Standard in the District of Columbia.

## 2.0 IMPLEMENTATION PLAN REVIEW

### 2.1 SUMMARY

A revision of fuel combustion source emissions regulations will depend on many factors:

- Does the State have air quality standards which are more stringent than NAAQS?
- Does the State have emission limitation regulations for control of (1) power plants, (2) industrial sources, (3) area sources?
- Did the State use an example region approach for demonstrating the attainment of NAAQS or more stringent State standards?
- Has the State not initiated action to modify combustion source emission regulations for fuel savings; i.e., under the Clean Fuels Policy?
- Are there no proposed Air Quality Maintenance Areas?
- Are there indications of a sufficient number of monitoring sites within a region?
- Is there an expected 1975 attainment date for NAAQS in the State Implementation Plan?
- Based on (1973) air quality data, are there no reported violations of NAAQS?
- Based on (1973) air quality data, are there indications of a tolerance for increasing emissions?
- Are the total emissions from stationary fuel combustion sources proportionally lower than those of other sources?
- Do modeling results for specific fuel combustion sources show a potential for a regulation revision?

The following portion of this report is directed at answering these questions. An AQCR's potential for revising regulations increases when there are affirmative responses to the above.

The initial part of the SIP review report, Section 2 and Appendix A, was organized to provide the background and current situation information for the State Implementation Plan. Section 3 and the remaining Appendices provide an AQCR analysis which helps establish the overall potential for revising regulations.

Based on an overall evaluation of EPA's current information, AQCRs have been rated as either a good, poor or marginal candidate for revising emission limiting regulations. These ratings which are shown in Table 2-1 were determined by assessing the following criteria:

| Good | Poor | Marginal |
|---|---|---|
| 1) Adequate number of air monitoring sites | 1) Violation of NAAQS | 1) No air quality data or insufficient number of monitoring sites |
| 2) No NAAQS violations | 2) Attainment date for NAAQS later than 1975 | 2) Inconsistent "indicators" |
| 3) Attainment date of 1975 for NAAQS in the SIP | 3) Proposed AQMA | |
| 4) No proposed AQMAs | 4) Modeling results show no potential for regulation revision | |
| 5) Modeling results show a potential for regulation revision | | |

For an AQCR to be rated as a good candidate, all of the criteria listed under "Good" would have to be satisfied. The overriding factor in rating an AQCR as a poor candidate is a violation of either the primary or secondary National Ambient Air Quality Standards during 1973. However, if any of the other conditions listed under "Poor" exists, the AQCR would still receive that rating. The predominant reason for a marginal rating is a lack of sufficient air quality data. In Priority III regions, air monitoring was not required during 1973, therefore, there may be no data with which to determine the current air quality status. Marginal ratings are also given when there are varying or inconsistent "indicators".

After a candidacy has been given to a region, a follow-up analysis should be conducted depending on the rating. A region that has been

indicated to be a good candidate for regulation revision should be examined in more detail by the State and the Regional office of the EPA, including an examination of current air quality, emissions, and fuel use data, with which the state has more familiarity. If the state feels that clean fuels could be saved in a region rated marginal then an analysis of air quality data that may have become available since this report should be examined. If current data do not indicate a potential for regulation revision then further study would not be warranted. An AQCR that has been indicated to be a poor candidate would not warrant further study unless the state feels that new information has become available indicating that the poor rating is no longer valid.

TABLE 2-1

DISTRICT OF COLUMBIA
IMPLEMENTATION PLAN REVIEW
(SUMMARY)

| "Indicators" | TSP | $SO_2$ |
|---|---|---|
| • Does the District of Columbia have air quality standards which are more stringent than NAAQS? | Yes | Yes |
| • Does the District of Columbia have emission limiting regulations for control of: | | |
| 1. Power plants | Yes | Yes |
| 2. Industrial sources | Yes | Yes |
| 3. Area sources | Yes | Yes |
| • Did the District of Columbia use an example region approach for demonstrating the attainment of NAAQS or more stringent standards? | No | No |
| • Has the District of Columbia <u>not</u> initiated action to modify combustion source emission regulations for fuel savings; i.e., under the Clean Fuels Policy? | Yes | Yes |
| • Are there <u>no</u> proposed Air Quality Maintenance Areas? | No | No |
| • Are there indications of a sufficient number of monitoring sites within the region? | Yes | Yes |
| • Is there an expected 1975 attainment date for NAAQS in the Implementation Plan? | Yes | Yes |
| • Based on (1973) Air Quality Data, are there no reported violations of NAAQS? | No | No |
| • Based on (1973) Air Quality Data, are there indications of a tolerance for increasing emissions? | No | No |
| • Are the total emissions from stationary fuel combustion sources proportionally lower than those of other sources? | No | No |
| • Do modeling results for specific fuel combustion sources show a potential for a regulation revision?[a] | No | No |
| • Based on the above indicators, what is the potential for revising fuel combustion source emission limiting regulations? | Poor | Poor |

[a] Modeling results available for power plants only.

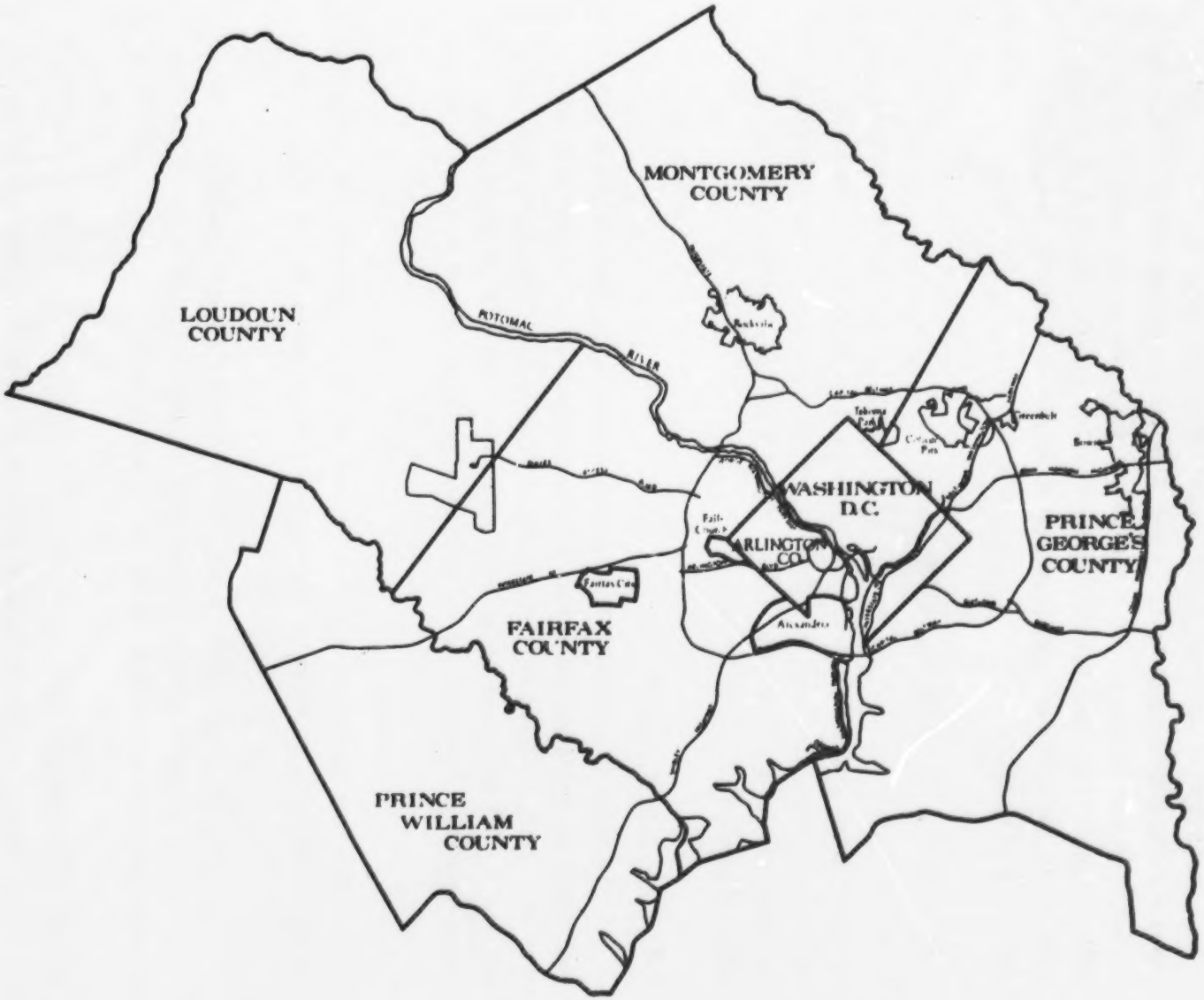


FIGURE 2-1 NATIONAL CAPITAL INTERSTATE AIR QUALITY CONTROL REGION

## 2.2 AIR QUALITY SETTING - DISTRICT OF COLUMBIA

### 2.2.1 Air Quality Control Region

The District of Columbia is a part of the National Capital Interstate Air Quality Control Region which also comprises the suburban counties of Maryland and Virginia. This region has been classified Priority I for both suspended particulates and sulfur dioxide and the District of Columbia portion of the AQCR has been proposed as an Air Quality Maintenance Area for these pollutants.

### 2.2.2 Ambient Air Quality Standards

The District of Columbia has adopted ambient air quality standards for both total suspended particulates and sulfur dioxide. As shown on Table A-2, these standards are more stringent than the Federal standards for both of these pollutants, except for the annual standard for suspended particulates which is identical.

### 2.2.3 Air Quality Status

Air quality data for 1973 are summarized in Tables A-4 and A-5 for suspended particulates and sulfur dioxide respectively. These data are from the "Annual Report on the Quality of the Air in Washington, D.C. 1973" and the SAROAD data bank as of July 1974. The District of Columbia has a comprehensive air monitoring network with which to determine the air quality status.

Both the annual and 24-hour Federal primary standards for suspended particulates were exceeded in the District of Columbia during 1973.

Sulfur dioxide levels exceeded the Federal annual standard in the District of Columbia portion of the AQCR during 1973. No other violations of the Federal $SO_2$ standard occurred in the region.

### 2.2.4 Emissions Summary

A summary of particulate and sulfur dioxide emissions are presented in Table A-6 and A-7 respectively. This information is from the "1973 Regional Emissions Inventory" compiled by the Metropolitan Washington Council of Governments.

Fuel combustion sources within the District of Columbia contribute approximately sixteen percent of the particulate and seventeen percent of the sulfur dioxide emissions in the region. The number of fuel combustion sources and the emissions attributed to these sources are shown in Table A-8, and also Appendix D.

## 2.3 BACKGROUND ON THE DEVELOPMENT OF THE DISTRICT OF COLUMBIA'S CURRENT IMPLEMENTATION PLAN

### 2.3.1 Control Strategy For Particulate Matter And Sulfur Oxides

On August 4, 1970, the District of Columbia submitted an implementation plan, under the requirements of the 1967 Amendments to the Clean Air Act, which was designed to attain the District's ambient air quality standards for sulfur oxides and particulate matter in the National Capital Interstate Air Quality Control Region. This implementation plan was evaluated by EPA to determine the extent to which it was consistent with the 1970 Amendments to the Act. On August 4, 1971, the Administrator forwarded to the Honorable Walter E. Washington, Mayor of the District of Columbia, a detailed evaluation of those portions of the District of Columbia's implementation plan which were approved and those portions which required changes in order to meet the requirements of the 1970 Amendments. The approvability of the control strategies was determined by use of the Implementation Planning Program (IPP) and the associated diffusion model. This modeling was used to predict the reductions in ambient concentrations of pollutants achieved by the combined control strategies of the District, Virginia, and Maryland.

The control strategies set forth by the District for particulate matter and sulfur oxides were approved. Some of the emission limiting regulations included in the approved strategies were adopted while some were proposed.

## 3.0 CURRENT ASSESSMENTS BASED ON IMPLEMENTATION PLAN REVIEW

The purpose of this section is to evaluate the available information for the District of Columbia and determine the feasibility of revisions to the SIP which would result in clean fuel conservation. The assessments will be made by AQCR addressing each type of fuel combustion source: power plants, large industrial and commercial/institutional sources, and area sources. The assessments must be made for each pollutant separately and are made on the basis of seven criteria: (1) 1973 air quality violations; (2) expected NAAQS attainment dates; (3) proposed Air Quality Maintenance Area (AQMA) designations; (4) total emissions; (5) portion of emissions from District of Columbia fuel combustion sources; (6) regional tolerance for emissions increase; and (7) pollutant priority classifications. Tables B-1 and B-2 tabulate these criteria for TSP and $SO_2$, respectively.

As mentioned previously, regional air quality data for 1973 are presented in Tables A-4 and A-5 for total suspended particulates and sulfur dioxide respectively. Table C-1 shows the 1973 fuel use and fuel sulfur content for the two District of Columbia power plants. The sulfur content is an average content for the year, as variations of up to 20% are common. Table C-2 is a summary of modeling results for one of the power plants[1]. Although it is realized that there are some limitations to results obtained by modeling, it is presented in this report as another indicator in assessing the candidacy of a region to revise emission regulations.

Appendix D shows the fuel use and emissions data for the major fuel combustion sources. Only those sources emitting 100 tons per year or more of either particulates or sulfur dioxide are listed. Appendix E shows the total fuel use for the District of Columbia.

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[1] The modeling analysis of the power plants was performed by the Walden Research Division of Abcor Inc. The model used was a Gaussian plume model developed by the Meterology Laboratory, EPA, and was based on 1972 plant operations. Detailed information can be found in; Modeling Analysis of Power Plants for Fuel Conversion, (Group III) September 9, 1974.

## 3.1 DISTRICT OF COLUMBIA PORTION OF THE NATIONAL CAPITAL INTERSTATE AIR QUALITY CONTROL REGION

### 3.1.1 Regional Assessment

The District of Columbia has been rated as a poor candidate for revision of either particulate or sulfur dioxide emission regulations.

During 1973, ambient levels of total suspended particulates exceeded the Federal primary annual and 24-hour standards in the District of Columbia (Table A-4). Violations of Federal standards also occurred in the Maryland and Virginia portions of the AQCR, affording virtually no potential for increasing particulate emissions. The National Capital Interstate AQCR has been proposed as an Air Quality Maintenance Area for particulate matter.

Sulfur dioxide levels violated the Federal annual standard in the District of Columbia portion of the AQCR during 1973 (Table A-5), while 24-hour values were close to the standard. There is no potential for increasing sulfur dioxide emissions in the District of Columbia.

### 3.1.2 Power Plant Assessment

There are two power plants in the District of Columbia portion of this region, the Buzzard Point and Benning plants. During 1973 Buzzard Point fired oil, while the Benning plant fired both oil and coal (Table C-1). These plants contribute approximately eight percent of the particulate, and nine percent of the sulfur dioxide emissions in the region.

There are some modeling data for the Buzzard Point plant presented in Table C-2 which show the maximum contribution to the ambient suspended particulate and sulfur dioxide levels that are attributable to the plant. The data indicate that with a switch to 3.0% sulfur coal, ambient levels of sulfur dioxide would be severly impacted, thereby eliminating the possibility of a fuel switch.

### 3.1.3 Industrial, Commercial, Institutional Source Assessment

The major fuel combustion sources other than power plants are listed

in Table D-1, along with their emissions. Fuel use data where available indicate that these sources are primarily oil fired, affording some potential clean fuel savings. However, as mentioned previously, there is no potential for increasing either particulate or sulfur dioxide emissions, therefore a switch to coal, or a higher sulfur content fuel oil is not feasible. Point source fuel combustion contributes a minimal amount of the particulate and sulfur dioxide emissions in the region.

### 3.1.4 Area Source Assessment

Area source fuel combustion accounts for approximately five percent of the particulate and sulfur dioxide emissions in the region. Fuel use by area sources is shown in Table E-1. There does not appear to be a significant clean fuel savings afforded by these sources.

### 3.1.5 Fuel Use Assessment

Fuel use data for the District of Columbia are presented in Appendix E.

APPENDIX A

IMPLEMENTATION PLAN BACKGROUND

TABLE A-1

District of Columbia Air Pollutant Priority Classification

| Air Quality Control Region | Priority Classification[a] Part. | $SO_2$ | 1975 Population (Millions) | Proposed AQMA Designations[b] |
|---|---|---|---|---|
| National Capital Interstate (Maryland, Virginia) | I | I | 3.16 | The District of Columbia has been proposed as an AQMA for both TSP and $SO_2$ |

[a]Criteria Based on Maximum Measured (or Estimated) Pollution Concentration in Area

| Priority | I | II | III |
|---|---|---|---|
| | Greater than ($\mu g/m^3$) | From - To ($\mu g/m^3$) | Less than ($\mu g/m^3$) |
| Sulfur Dioxide: | | | |
| Annual arithmetic mean | 100 | 60 - 100 | 60 |
| 24-hour maximum | 455 | 260 - 455 | 260 |
| Particulate matter: | | | |
| Annual Geometric mean | 95 | 60 - 95 | 60 |
| 24-hour maximum | 325 | 150 - 325 | 150 |

[b]Federal Register, August, 1974, SMSA's showing potential for NAAQS violations due to growth.

TABLE A-2

Ambient Air Quality Standards

| | | Total Suspended Particulates($\mu g/m^3$) | | Sulfur Dioxide($\mu g/m^3$) | | | |
|---|---|---|---|---|---|---|---|
| | | Annual | 24-Hour | Annual | 24-Hour | 3-Hour | 1-Hour |
| Federal | Primary | 75(G) | 260[a] | 80(A) | 365[a] | - | - |
| | Secondary | 60(G) | 150[a] | - | - | 1300[a] | - |
| District of Columbia | Primary | 75(G) | 160[a] | 75(A) | 285[a] | - | 860[a] |
| | Secondary | 60(G) | 140[a] | 57(A) | 225[a] | - | 715[a] |

(G) Geometric mean

(A) Arithmetic mean

a - Not to be exceeded more than once per year

TABLE A-3

AMBIENT AIR QUALITY STANDARDS ATTAINMENT DATES[a]
DISTRICT OF COLUMBIA

| Particulates | | Sulfur Dioxide | |
|---|---|---|---|
| Primary | Secondary | Primary | Secondary |
| 7/75 | 7/75 | 7/75 | 7/75 |

[a]Attainment dates as submitted in State Implementation Plan.

TABLE A-4

DISTRICT OF COLUMBIA AIR QUALITY STATUS (1973), TSP[a]

| AQCR | # Stations Reporting | TSP Concentration ($\mu g/m^3$) Highest Reading Annual | Highest Reading 24-Hr. | 2nd Highest Reading 24-Hr. | # Stations Exceeding Ambient Air Quality Standards: Primary Annual | Primary 24-Hr[b] | Secondary Annual | Secondary Annual % | Secondary 24-Hr[b] | Secondary 24-Hr % | % Reduction Required to Meet Standards[c] | Standard on Which % Reduction Is Based |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| National Capital Interstate (VA, MD) | 64 | 85 | 668[d] | 351[d] | 2 | 3 | 7 | 11 | 7 | 11 | +65 | 24-Hr |
| DC Portion of AQCR | 11 | 85 | 456[e] | 415[e] | 1 | 2 | 2 | 18 | 6 | 55 | +71 | 24-Hr |

[a] Sources of data: National Air Data Bank, July 28, 1974; Annual Report on The Quality of the Air in Washington, D.C., 1973

[b] Violations based on more than one reading in excess of standard

[c] Formula: $\left(\frac{\text{2nd Highest 24-Hr - 24 Hr Secondary Standard}}{\text{2nd Highest 24-Hr - Background}}\right) \times 100$, $\left(\frac{\text{Annual - Annual Secondary Standard}}{\text{Annual - Background}}\right) \times 100$

Background Value: 40 $\mu g/m^3$

[d] Reading recorded in Virginia portion of AQCR

[e] Values can be attributed to fugitive dust emissions rather than fuel burning emissions

TABLE A-5

DISTRICT OF COLUMBIA AIR QUALITY STATUS (1973), $SO_2$[a]

| AQCR | # Stations Reporting 24-Hr (Bubbler) | # Stations Reporting (Contin.) | $SO_2$ Concentration ($\mu g/m^3$) Highest Reading Annual | Highest Reading 24-Hr. | 2nd Highest Reading 24-Hr | # Stations Exceeding Ambient Air Quality Stds. Primary Annual | % | 24-Hr[b] | % | Secondary 3-Hr | % Reduction Required To Meet Standards | Standard on which % Reduction Is Based |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| National Capital Interstate (VA, MD)[d] | 26 | 12[e] | 12 | 351 | 322 | 1 | 25 | 0 | - | N.A. | +14 | Annual |

[a] Sources of Data: National Air Data Bank, July 28, 1974: Annual Report on The Quality of the Air in Washington, D.C. 1973

[b] Violation based on 2nd highest reading at any station

[c] Formula:

$$\left(\frac{\text{2nd Highest 24-Hr - 24-Hr Standard}}{\text{2nd Highest 24-Hr}}\right) \times 100, \quad \left(\frac{\text{Annual - Annual Standard}}{\text{Annual}}\right) \times 100$$

[d] Values shown are for D.C. portion of AQCR

[e] Includes four stations in D.C.

TABLE A-6

DISTRICT OF COLUMBIA PARTICULATE EMISSIONS SUMMARY[a]

| Air Quality Control Region | Total ($10^3$ tons/yr) | % | Electricity Generation ($10^3$ tons/yr) | % | Point Source Fuel Combustion[b] ($10^3$ tons/yr) | % | Area Source Fuel Combustion ($10^3$ tons/yr) | % |
|---|---|---|---|---|---|---|---|---|
| National Capital | | | | | | | | |
| Dist. of Columbia | 7.2 | 21 | 2.6 | 36 | 1.3 | 18 | 1.6 | 22 |
| Other (Md. & Va.) | 27.1 | 79 | 10.3 | 38 | 0.8 | 3 | 1.6 | 6 |
| Total | 34.3 | 100 | 12.9 | | 2.1 | | 3.2 | |

[a] Source: 1973 Regional Emissions Inventory, Metropolitan Washington Council of Governments, March 3, 1975

[b] Excludes emissions from electricity generation

TABLE A-7

DISTRICT COLUMBIA SULFUR DIOXIDE EMISSIONS SUMMARY[a]

| Air Quality Control Region | Total ($10^3$ tons/yr) | % | Electricity Generation ($10^3$ tons/yr) | % | Point Source Fuel Combustion[b] ($10^3$ tons/yr) | % | Area Source Fuel Combustion ($10^3$ tons/yr) | % |
|---|---|---|---|---|---|---|---|---|
| National Capital | | | | | | | | |
| District of Columbia | 41.1 | 17 | 20.3 | 49 | 7.2 | 18 | 12.4 | 30 |
| Other (Md. and Va.) | 196.3 | 83 | 173.5 | 89 | 4.2 | 2 | 16.0 | 8 |
| Total | 237.4 | 100 | 193.8 | | 11.4 | | 28.4 | |

[a] Source: 1973 Regional Emissions Inventory, Metropolitan Washington Council of Governments, March 3, 1975

[b] Excludes emissions from electricity generation

TABLE A-8

DISTRICT OF COLUMBIA FUEL COMBUSTION SOURCE SUMMARY

| Power Plants | Other Fuel Combustion Point Sources[a] | | District of Columbia Emissions[b] ($10^3$ tons/yr) | | Total AQCR Emissions[c] ($10^3$ tons/yr) | | % Emissions From D.C. - Fuel Combustion[d] | |
|---|---|---|---|---|---|---|---|---|
| | Part. | $SO_2$ | Part. | $SO_2$ | Part. | $SO_2$ | Part. | $SO_2$ |
| 2 | 5 | 15 | 5.5 | 39.9 | 34.3 | 237.4 | 16 | 17 |

[a] Sources other than power plants which emit more than 100 tons per year of the specified pollutant.

[b] Emissions from fuel combustion only

[c] Emissions from all sources

[d] Percent of total AQCR emissions

TABLE A-9

DISTRICT OF COLUMBIA FUEL COMBUSTION EMISSION LIMITING REGULATIONS

I. Particulate Matter

A. For installations using less than $3.5 \times 10^6$ BTU/hour total heat input, emissions are not to exceed 0.13 pounds/hour.

B. For installations using more than $3.5 \times 10^6$ but less than $10{,}000 \times 10^6$ BTU/hour total heat input, emissions are not to exceed $0.17455H^{-0.23522}$ pounds/hour where H equals the total heat input in $10^6$ BTU/hour. (Figure A-1)

C. For installations using more than $10{,}000 \times 10^6$ BTU, emissions are not to exceed 0.02 pounds/hour.

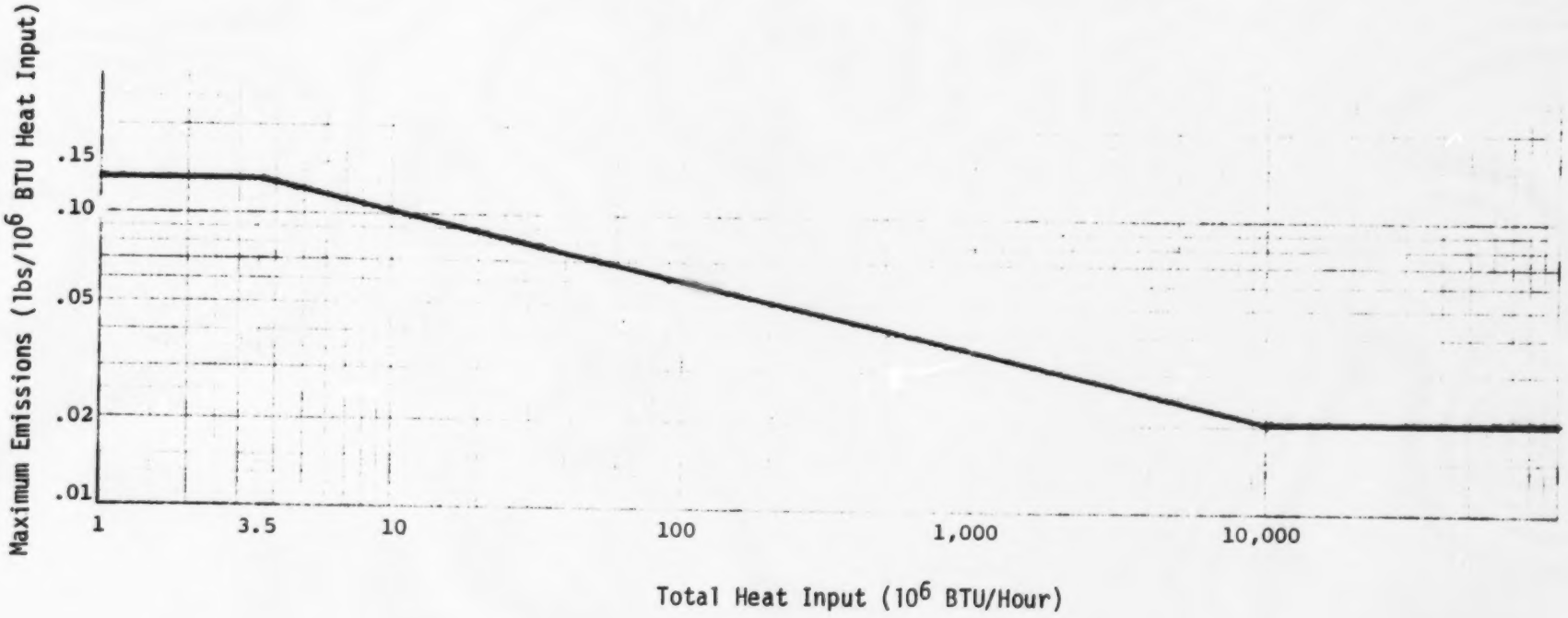
II. Sulfur Oxides

A. Fuel oils limited to 1% or less sulfur by weight. On and after July 1, 1975, the sulfur content of such fuel oil is limited to 0.5% or less sulfur by weight.

B. Coal sulfur content is limited to 1% or less by weight. On and after July 1, 1975, the sulfur content of such coal shall not exceed 0.5% by weight: provided that when the Commissioner certifies that the combustion - gas - desulfurization system used at a stationary source results in sulfur oxide emissions no greater than the emissions normally resulting from the burning of coal with 1% sulfur content and, after July 1, 1975 with 0.5% sulfur content, coal of a higher sulfur content may be burned at such stationary source.

FIGURE A-1

ALLOWABLE PARTICULATE EMISSIONS FROM FUEL COMBUSTION SOURCES



# APPENDIX B

## REGIONAL SUMMARY

TABLE B-1

SUMMARY OF INDICATORS FOR REVISION OF PARTICULATE EMISSION REGULATIONS

| | Air Quality | | Particulate Emissions ($10^3$ tons/yr)[b] | % Emissions From D. C. Fuel Combustion[c] | TSP Priority | Attainment Date | AQMA Proposed? |
|---|---|---|---|---|---|---|---|
| | Number of Stations | Number of Violations[a] | | | | | |
| National Capital Interstate AQCR | 64 | 14 | 7.2 | 16 | I | 7/75 | Yes |

[a] Violations of secondary standards

[b] District of Columbia sources only

[c] Percent of total region emissions

TABLE B-2

SUMMARY OF INDICATORS FOR REVISION OF $SO_2$ EMISSION REGULATIONS

| | Air Quality | | | | | | |
|---|---|---|---|---|---|---|---|
| | Number of Stations | Number of Violations | $SO_2$ Emissions ($10^3$ tons/yr)[a] | % Emissions From D. C. Fuel Combustion[b] | $SO_2$ Priority | Attainment Date | AQMA Proposed? |
| National Capital | 38 | 1 | 41.1 | 17 | I | 7/75 | Yes |

[a] District of Columbia sources only

[b] Percent of total region emissions

APPENDIX C

POWER PLANT SUMMARY

TABLE C-1

DISTRICT OF COLUMBIA POWER PLANT FUEL USE SUMMARY[a]

| Plant | 1973 Capacity (MW) | 1973 Fuel Use | | | 1974 Fuel | SIP |
|---|---|---|---|---|---|---|
| | | Type | % S | Quantity[b] | % S | % S |
| Benning | 718.34 | Coal | 0.9 | 260 | 0.83 | 1.0 |
| | | Oil | 0.9 | 4122 | 0.80 | |
| Buzzard Point | 270.0 | Oil | 0.9 | 1225 | 0.96 | 1.0 |

[a] Source: FPC Form #67 May 1, 1974. Steam-electric air & water quality control data for year ending Dec. 31, 1973.

[b] Coal quantity is in $10^3$ tons, oil is in $10^3$ barrels.

TABLE C-2

SUMMARY OF POWER PLANT MODELING RESULTS[a]

| Plant | Maximum 24-Hour Concentration ($\mu g/m^3$) | | | | Maximum Annual Concentration ($\mu g/m^3$) | |
|---|---|---|---|---|---|---|
| | $SO_2$ | | Particulates | | | |
| | Nominal Load | Maximum Load | Nominal Load | Maximum Load | $SO_2$ | Particulates |
| Buzzard Point | | | | | | |
| 1972 Operations[b] | 128 | 246 | 15 | 26 | 15 | 1 |
| Fuel Switch[c] | 445 | 808 | 17 | 34 | 45 | 2 |

[a] Source: Modeling Analysis of Power Plants For Fuel Conversion, Group III Walden Research Sept. 9, 1974

[b] Based on 0.9% sulfur residual oil

[c] Switch to 3.0% sulfur coal

## ADDENDUM TO APPENDIX C

## USE AND LIMITATIONS OF MODELING ANALYSIS DATA[a]

1. The data inputs for the modeling have been extracted from the appropriate FPC Form 67 and the most representative meteorological data available. However, to calculate the occurrence of the highest 24-hour concentration, assumptions as to the daily emission rate are necessary. The results of the modeling exercise provide a range of the most probable maximum concentration.

2. It should be recognized that time and data constraints are such that the model predictions are useful but not omniscient. There are no data available, in general, to "validate" the model. Therefore, all relevant data, including hard data on actual daily plant operations, should be obtained, reviewed, and evaluated. In this way, the modeling results can be used as a logical part of the entire decision-making framework, not as an arbitrary, dogmatic absolute "answer", divorced from the real situation involved. In some cases it will be necessary to adjust the model's predictions based upon more complete and detailed information on a particular plant's operations.

3. Results of these evaluations are not intended to be used in any legal actions, including both public hearing and court proceedings. The very nature of atmospheric dispersion modeling is such that results are not suitable to legally prove (or disprove) a particular modeling result. The assumptions and judgments necessarily involved in modeling tend to mitigate against proof in a legal sense.

4. The best use of the data is in negotiations with states or sources in trying to establish a rational course of action to be followed with reasonable assurance that the air quality impact will be as indicated by the model.

[a]Extracted from comments by the Monitoring and Data Analysis Division, OAQPS

APPENDIX D

INDUSTRIAL, COMMERCIAL, INSTITUTIONAL SOURCE LISTING

TABLE D-1

INDUSTRIAL, COMMERCIAL, INSTITUTIONAL SOURCE LISTING[a]

| Source | Fuel Use | | Emissions (Tons/Year) | |
|---|---|---|---|---|
| | Type | Quantity[b] | Part. | $SO_2$ |
| Central Heating Plant | Coal | 120 | 102 | 1558 |
| West Heating Plant | Coal | 100 | 259 | 1084 |
| Washington Navy Yard | -- | --- | 405 | 927 |
| Capitol Power Plant | -- | --- | 270 | 562 |
| Saint Elizabeth's Hosp. | Oil | 204 | 58 | 399 |
| Washington Terminal Co. | -- | --- | 121 | 356 |
| Naval Research Lab | -- | --- | 49 | 341 |
| Walter Reed AMC | Oil | 87.9 | 47 | 319 |
| Howard Univ. | Oil | 36.7 | 34 | 215 |
| Washington Hosp. Center | -- | --- | 29 | 199 |
| D.C. General Hosp. | -- | --- | 22 | 153 |
| U.S. Soldiers Home | -- | --- | 22 | 150 |
| Anacostia Naval Station | Oil | 40.5 | 19 | 130 |
| Bolling AFB | Oil | 51.5 | 19 | 130 |
| Georgetown Univ. | -- | --- | 19 | 103 |

[a] Sources listed are those that emitted 100 tons or more of either particulate matter or sulfur dioxide during 1973. Data are from D.C. Emission Inventory (May 1, 1974) except for fuel use data which are from NEDS.

[b] Coal is in $10^3$ tons, oil is in $10^3$ barrels.

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# APPENDIX E

## FUEL USE SUMMARY

### TABLE E-1
### DISTRICT OF COLUMBIA FUEL USE SUMMARY[a]

| | Coal ($10^3$ tons) | | Oil ($10^3$ Barrels) | | Gas ($10^6$ Cu. Ft.) | |
|---|---|---|---|---|---|---|
| | Anthracite | Bituminous | Residual | Distillate | Natural | Process |
| Area Sources | | | | | | |
| Residential | 0 | 3 | 1,524 | 1,037 | 17,226 | 0 |
| Indust., Comm., Inst. | 0 | 280 | 2,814 | 629 | 11,817 | 0 |
| Total | 0 | 283 | 4,338 | 1,666 | 29,043 | 0 |
| Point Sources | | | | | | |
| External | | | | | | |
| Elec. Gen. | 0 | 260 | 5,347 | 0 | 0 | 0 |
| Indust., Comm., Inst. | 0 | 223 | 800 | 162 | 545 | 0 |
| Total | 0 | 483 | 6,147 | 162 | 545 | 0 |
| Grand Total | 0 | 766 | 10,485 | 1,828 | 29,588 | 0 |

[a] Source: 1973 Regional Emissions Inventory, Metropolitan Washington Council of Governments, March 3, 1975

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